DOCUMENT RESUME

ED 085 875 EA 005 758

TITLE	School Sites: Selection, Development and Utilization. Educational Facilities Series: A Guide to Planning.
INSTITUTION	New Jersey State Dept. of Education, Trenton. Bureau of Facility Planning.
PUB DATE	73
NOTE	30p.
AVAILABLE FROM	Director of the Bureau of Facility Planning, State Department of Education, 225 West State Street, Trenton, New Jersey 08625 ($1.00)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Administrator Guides; Cost Effectiveness; Educational Facilities; Environmental Influences; Information Sources; Land Acquisition; Landscaping; *Land Use; Planning (Facilities); Safety; *School Planning; Shared Services; *Site Development; *Site Selection; Soil Science; *Specifications; Topology; Traffic Patterns

ABSTRACT

School sites are an integral part of educational facilities. Modern educational programs emphasize the discovery approach to learning where pupils do more than just read about the world around them. For example, they become active explorers and participate in discovering nature and how best to enjoy it and care for it. Thus, there is a curricular use for a site. Every part of the school program can involve some activity in the out-of-doors. Consequently, any consideration of the need for and design of educational facilities must, by necessity, include a careful analysis of the site, including its selection, development, and planned utilization. This bulletin is written to assist school administrators, local boards of education, planning consultants, and school architects in that process. Specific guidelines are offered with regard to desirable sites and their characteristics of size, shape, topography, subsurface conditions, surrounding conditions, and location. Suggestions are offered to alleviate the limitations of inadequate sites, where the financial problems of land purchase require alternate solutions. The importance of planning to protect and enhance the environment is cited, several types and sources of information useful in site selection are listed, and a selected bibliography is provided. (Author/MLF)

ED 085875

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

SCHOOL SITES:

Selection, Development and Utilization

EDUCATIONAL FACILITIES SERIES

A GUIDE TO PLANNING

EA 005 758

State of New Jersey
Department of Education
Division of Field Services
Bureau of Facility Planning
Trenton, New Jersey

FILMED FROM BEST AVAILABLE COPY

ED 085875

SCHOOL SITES:

Selection, Development and Utilization

PREPARED BY
Bureau of Facility Planning
Division of Field Services
New Jersey State Department of Education
Trenton, New Jersey

1973

Edward W. Kilpatrick, *Acting Commissioner of Education*
John Rosser, *Director, Division of Field Services*
Edward A. Spare, *Director, Bureau of Facility Planning*

TO OBTAIN COPIES

Requests for additional copies of this publication should be made to the Director of The Bureau of Facility Planning, State Department of Education, 225 West State Street, Trenton, New Jersey 08625. The price is $1.00 per copy. Payment must be made in advance by check or money order payable to the Commissioner of Education.

STATE BOARD OF EDUCATION

MR. CALVIN J. HURD, President	Roselle
MRS. KATHERINE L. AUCHINCLOSS, Vice President	Ridgewood
MR. PAUL J. CHRISTIANSEN	West Orange
MRS. MARION G. EPSTEIN	Princeton
MR. JOHN J. GROSSI, JR.	Westfield
MRS. RUTH MANCUSO	Glassboro
MRS. M. PATRICIA O'HARA	Butler
DR. ALLEN G. POTTER, JR.	Neshanic Station
MR. HARRY M. SEALS	Annandale
MR. JACK SLATER	Paterson
MR. GEORGE F. SMITH	Edison
MRS. HELEN A. ZEHNER	Woodstown

SECRETARY

EDWARD W. KILPATRICK, *Acting Commissioner of Education*

CONTENTS

	Page
Preface	vii
Desirable Site Characteristics	1
Size	2
Recommended Site Sizes	6
Where land is at a Premium	7
Unusual Circumstances and Planned Solutions	8
Shape	9
Topography	10
Sub-Surface Conditions	11
Test Borings and Surveys	11
Survey Requirements	11
Location	12
Accessibility	12
Safety Features	13
Environment	14
Economic Considerations	15
Alternate Sites	15
Initial and Development Costs	16
Joint Use of Sites	17
Supplementary Considerations	18
Orientation of Building on the Site	18
Control of Micro-Climate	19
Screening Devices	19
Erosion Prevention	19
Beautification	20
Information and Assistance	21
Approvals	23
Selected References	24

PREFACE

School sites are an integral part of educational facilities. Modern educational programs emphasize the discovery approach to learning where pupils do more than just read about the world around them. For example, they become active explorers and participate in discovering nature and how best to enjoy it and care for it. Thus, there is a curricular use for a site. Every part of the school program can involve some activity in the out-of-doors. Drawing, measuring, dissecting, planting, and building are some of the desirable outdoor activities in addition to physical education and sports. Consequently, any consideration of the need for and design of educational facilities must, of necessity, include a careful analysis of the site, including its selection, development and planned utilization. This bulletin is written to assist school administrators, local boards of education, planning consultants and school architects in that process.

DESIRABLE SITE CHARACTERISTICS

A desirable site sufficient for building location and its safe, easy utilization as well as for implementing the outdoor activities of a complete and modern educational program should possess the following characteristics:

1. a **size** which provides adequate useable area for conducting the many educational and recreational activities to be engaged in by pupils;
2. a **shape** which does not restrict any phase of the educational program;
3. a **topography** which will provide an adequate amount of level area (turfed and paved) for physical education, some uneven and wooded areas for use in other phases of the program, a variety of tree and plant life, and some water area for use in various parts of the educational program;
4. **sub-surface** conditions which provide adequate drainage and support for structures;
5. **surrounding conditions** which contribute to rather than detract from natural drainage and desired land use;
6. a **location** which is safe, readily accessible to pupils, utilities, and services, free from noise, air pollution and other disturbing elements. A site should also be available at a **cost** which is not exorbitant and unreasonable and which reflects desirable aesthetic qualities.

SIZE

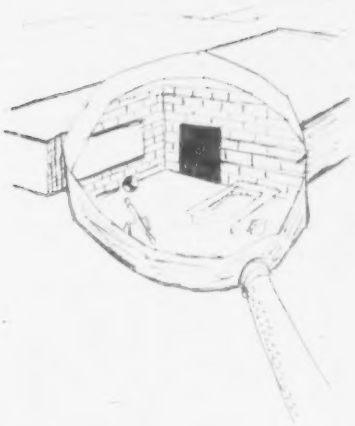
INTRODUCTION

Recommendations relative to site size are made at the end of this section. They were not arbitrarily contrived. Serious consideration was given to the type of activities which occur on school sites. A discussion of these activities follows as a rationale for the site size recommendations.

Specifications for a school site must be sufficiently broad and flexible to allow for variations in the character of the school district in which the site is located, the size and type of school to be built, and the educational program and activities to be accommodated. The selection of a site for a school building involves technical and educational factors which affect the entire community. Every effort should be made to engage the *cooperative* efforts of all parties concerned, including board of education members, school administrators, teachers, pupils, municipal officials, planning boards, other interested citizens' groups, and consultants, including those from the State Department of Education.

Modern curricula include more activities outside the buildings than ever before. Consequently, school sites should have a sufficient design variety to permit simultaneous activities to occur. There is with this, of course, a direct correlation to site size.

Early childhood education demands a well-planned outdoor play and learning area. The outdoor activities are usually unstructured but have serious purposes. Those purposes have as some of their foci developing the senses of feel, touch, and hearing, and sight discrimination. Other purposes focus on developing shape and size discrimination, language and mathematics readiness, the group process; still others focus on activities of a specific local design. Program requirements include surfaces which are both paved and unpaved and a variety of largely non-moving equipment of varying shapes, sizes and colors through which the children may roam.



The early childhood education and recreation areas should be located away from areas assigned to older children and close to special entrances and other needed facilities such as lavatories and toilets. In many cases, they should be protected by imaginative fencing or similar means. The play areas should be properly drained to allow faster drying following inclement weather.

Outdoor learning experiences for kindergarten and Pre-K children must include space for varied supervised and free play activities and include surfaces of varied textures. At this age, development of the larger muscles and manipulative skills should be emphasized. Outdoor play facilities may, in addition to the variety of surfaces, include nature trails, sand boxes, ponds, rock piles, fountains, hills, play equipment and the like in conjunction with areas for informal or "low" organized games. There is a wide range of activities which can be offered by the average school with a minimum of expense.

In elementary schools, the physical growth and development of children vary. For young children, activities tend to be carried on as individuals, but as children get older they play more in groups and teams. Some basic activities such as walking, running, jumping, skipping, hopping, climbing, pulling, throwing, and catching, are emphasized in the physical education activities of younger children. In free play, these are the same activities in which the child engages. Changes in activity patterns are frequent with young children because of the shorter interest span and lack of endurance. The games of older children include and repeat these same physical activities but emphasize the development of skills and are carried on for longer periods of time.

One of the basic needs for children, then, is adequate play space. Typical activities require a portion of the site which has a contour and surfacing suitable for vigorous activity of individuals and groups. Properly turfed areas are important. In addition, elementary schools need some hard-surfaced areas for activities demanding them and which can be used for nearly all activities during the time the grounds are wet or snow-covered.

Children in the *10 to 14 age group* also require activity areas suited to their particular needs, abilities and interests. It should be substantially larger than an area required for the lower age groups. Organized activities and games such as field hockey, soccer, softball, volleyball and variations of football require turfed areas. Hardsurface areas are needed for hopscotch, shuffleboard, basketball, handball, tennis, squash, and many other games. Some compacted earth surfaces and mounds may be desirable for a variety of activities such as climbing, marbles and outdoor winter sports. Swimming pools are increasingly desirable for both school and community use.

In general, secondary schools have interscholastic and intramural athletics as part of a total school program. An optimum condition is to provide areas where both the athletics and physical education and recreation programs can be conducted. It is always a difficult decision, but based on the numbers of students involved, priority should be assigned to the physical education and recreation programs.

The types of spaces or areas to be provided should include, but not be limited to, accommodating the activities of archery, baseball, football, golf, shuffleboard, soccer, tennis, track and field and volleyball. Depending upon local preference, this list may be increased or decreased in scope.

High school driver education programs present another site requirement. It is most desirable to have a driver education range on the total school site. Such a facility would permit a few teachers to give instruction in a few vehicles simultaneously. Traditionally, the number of vehicles, and thus the number of students involved, is dependent upon the number of teachers available and the size of the site. A new approach to driver education, called the "multiple car method," permits several automobiles to be operated simultaneously on a special on-site facility, under the direction of one or more teachers positioned outside the vehicles. The instructors typically communicate with the students by radio. This special facility can also provide more realistic driving conditions and stage possible hazardous conditions in a controlled situation. Specific site requirements result.

A site requirement at most secondary schools is providing for traffic control. The requirement is highlighted at senior high schools where many students drive to school and several hundred spectators drive to interscholastic sports events. Primary planning factors include appropriate entrances and exits, special monitoring devices, traffic circulation patterns which insure safe and uncongested movement, and landscaping. Special attention should be given to the safe and quick entrance and exit of service vehicles as well as ascertaining that emergency vehicles such as police cars, ambulances, and fire apparatus may get to and from the school quickly.

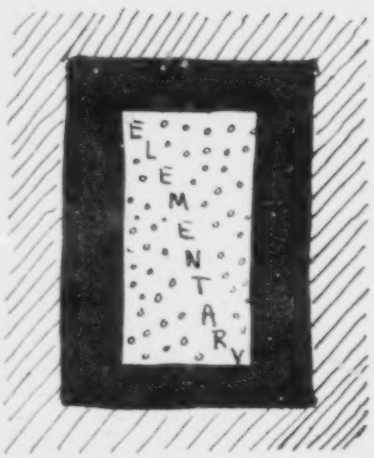
A properly developed site can, of course, be adjunctive to interior instructional space at schools of all levels. Therefore, school sites may include a band shell, tot-lot, outdoor theater, picnic grounds, park, or other areas of local school and community preference. Most often. the age level of the students served by the site and building will determine the type of these adjunctive areas.

RECOMMENDED SITE SIZES

Given a consideration of the program and activity factors relating to site size requirements as presented above, the following minimum site sizes are recommended as planning guidelines.

- **Elementary or Primary Schools**
  It is recommended that there be provided a minimum base site of ten acres plus one acre for each 100 students (or fraction) of projected maximum enrollment at the school, even if the ultimate structure will not be built at the initial construction stage. For example, an elementary school for 500 youngsters should have a minimum site of 15 acres.

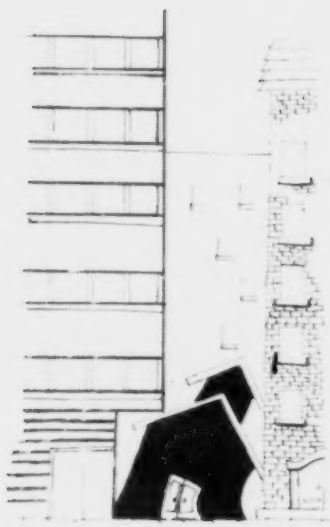
- **Junior High and Middle Schools**
  It is recommended that there be provided a minimum base site of 20 acres plus one acre for each 100 students (or fraction) of projected maximum enrollment at the school, even if the ultimate structure will not be built at the initial construction stage. For example, a junior high or middle school for 750 pupils should have a minimum site of 28 acres.



- **Combination Junior High or Middle School and an Elementary School**
  It is recommended that the junior high-middle school guidelines be applied to such combinations. It should not be necessary to pro-rate the number of students by type of school and then apply the site guidelines.

- **Senior High School**
  It is recommended that there be provided a minimum base site of 30 acres plus one acre for each 100 students (or fraction) of projected maximum enrollment at the school, even if the ultimate structure will not be built at the initial construction stage. For example, a high school for 1,000 students should have a minimum site of 40 acres.

- **Combination Junior High or Middle School and a Senior High School**
  It is recommended that the guidelines for senior high school sites be applied. It should not be necessary to pro-rate the number of students by the type of school and then apply the site guidelines.



WHERE LAND IS AT A PREMIUM

In older cities very often acute congestion and high property costs make the problem of purchasing sites for new schools or expanding existing sites rather costly and complex. The following suggestions are offered for investigation as a means to alleviate the limitations of inadequate sites where the financial problems of land purchase require alternate solutions.

To satisfy the need for outdoor education areas and playfields, it may be necessary to: (1) stagger recreational periods so that only a portion of the student body, especially in elementary schools, is in the playfield at any one time; (2) plan for multi-use of the same area at different times of the day or during different seasons, such as having baseball practice fields, football practice fields, or areas for unorganized play in the same space; or, (3) build the school contiguous to a public playground or park which is available, by written agreement, for school purposes.

In reference to the *building* itself, it may be most feasible to: (1) construct a multi-story building with elevators or moving stairs; (2) elevate the structure so that one or more play areas are available beneath it; (3) place play areas on the roof; (4) build some facilities underground or remotely located, such as, parking, heating plants, and storage; (5) enter joint occupancy arrangements where site and building are shared between education and commerce, industry or housing; or, (6) purchase or lease air rights above highways, railroad tracks and yards, or other urban-type structures.

In the urban school setting, innovative and imaginative solutions to the use and development of the school site can introduce economies as well as extend the impact of the school and its program.

UNUSUAL CIRCUMSTANCES AND PLANNED SOLUTIONS

In those instances where acreage is available at a reasonable cost and where removing land masses from industrial growth and tax revenue production is plausible, the design of a building often takes a different appearance. There is, for example, an increasing popularity of one-story schools, for reasons of aesthetics as well as quick egress under emergency conditions.

Whether you plan a single or multi-storied building may be local option or dictated by limits of land availability. What is important is finding a way, through planning and architectural skills, to provide for the education program, whatever the grade or age level of a school.

Other architectural solutions have been developed to address specific education, organization, support, and community-use needs. The needs revolve around the desire to personalize the process of education, the shared use of very expensive facilities, the designed interaction of older students with the younger, proposed economies in operating expenses and a myriad of other factors. The educational planning and architectural design response has been the design, development, and construction of campus-plan schools, educational parks, buildings of single-loaded corridors, or, indeed, no corridors, and district consolidation which establishes larger, more centralized, schools. All of these approaches have and will continue to affect the size of sites. Even in these new approaches, however, the established guidelines should be applied.

SHAPE

The shape of a site, as well as its size, should be determined by the functional requirements of its use. This requires an early definition of the intended use of the site and the application of this guideline during any site search.

As a very general rule-of-thumb, an efficient plan can be achieved on a rectangular site with dimensions in a ratio of approximately three to five. There are exceptions to the rule. It is possible, of course, to develop an acceptable site on an irregularly shaped plot through appropriate design and placement of the building and outdoor facilities. Also, the use of the site can be adjusted according to the type of school to be constructed.

TOPOGRAPHY

An attractive site with a variety of features provides the most utility for educational purposes. Radical elevation changes and low marsh lands should be avoided where the building is to be situated in order to preclude the design of special and costly engineering and architectural solutions usually not confronted in a more flat-land area. The optimum drainage for the building area and the playground, physical education or athletic facilities, within the bounds of a given site, is attainable on a convex portion.

Although they should be avoided when possible, sloping sites need not be ruled out for selection. Some such sites can be divided or partitioned according to elevation and the divisions utilized for certain site functions. For example, a two-part site can accommodate the building at the higher elevation and the outdoor facilities at the lower elevation.

Once adequate areas have been provided for the building and physical activity areas, additional acreage offering a variety of characteristics is desirable. Wooded slopes, rock outcroppings, boulders, mounds, pits, streams, ponds, marsh lands, and hills—all considered undesirable for school purposes not too many years ago—have been found to have great educational value in a complete outdoor education program. It is generally accepted today that the preservation of such characteristics on a school site provides a desirable setting for many areas of the school curriculum, particularly conservation, science, art, and economics.

SUB-SURFACE CONDITIONS

Adverse subsoil conditions such as rock, poor bearing soils, high water levels and soils impervious to water will usually cause difficulties and increase development and perhaps operation costs. Obviously, a site should not be seriously considered for a school building unless these matters have been investigated. No building should be designed before its proposed location has been subjected to a thorough sub-surface inspection by means acceptable to those responsible for design success and implementation.

All sites under consideration should be investigated for a potential water supply. This is, of course, mandatory if an existing municipal or regional water supply is not available to the school. The New Jersey Department of Environmental Protection has published requirements for percolation which must be met under certain circumstances.

A very expensive error can be made by failure to obtain a site from which potable water may be derived and from which the effluent from approved sewage treatment facilities may be discharged. Soils that permit proper percolation, on the other hand, will make lawns, playfields and athletic facilities easier and less expensive to maintain. A likely result is a more extensive use of such facilities.

Soil and sub-surface conditions are particularly important from the standpoint of sewage disposal if public sewers are not available. The site should be free of drainage from contiguous territory and should permit proper drainage throughout at a reasonable cost. Rapid drainage and quick drying, as noted above, should particularly characterize that part of the plot which is expected to serve as recreational and play areas.

TEST BORINGS AND SURVEYS

Test borings should be conducted on every proposed site to determine the general character of the soil and surface conditions relative to rock formations, hardpan, the local water table, drainage and the potential soil compaction of the location and support of a school. Obviously, discovery of negative findings relative to rocks, water and drainage can be enough to remove a site from consideration. Generally speaking, sandy loam soils are preferred while clay loams may be considered second choice. Heavy clay, gravel or extremely sandy soil are the least desirable and can also offer sufficient reason to reject a site which has been under consideration.

As a means of getting valuable advice, consideration should be given to the employment of a soils engineer as a consultant.

SURVEY REQUIREMENTS

After a site has been finally selected, it is of utmost importance to obtain an accurate boundary line and topographic survey of the property prior to State Department of Education approval and purchasing the site.

LOCATION

ACCESSIBILITY

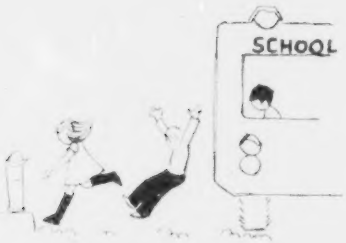
Schools should usually be located near the center of the present and the potential future school population to be served. Yet there are exceptions to this rule-of-thumb; like the large supermarkets, schools are finding that a large, more-complete site, perhaps removed from the center of population, is preferable to a small restricted site more centrally located. The increasing ease of transportation tends to nullify the initial advantages of a centrally located site. In this case, the safety and convenience of site ingress and egress are of greater relative importance. However, where student transportation is involved, the maximum travel time for elementary pupils should rarely exceed thirty minutes, and one hour should be the limit for secondary pupils. For cyclists, special paths and covered bicycle racks should be provided.

Access to the school site should be guaranteed by the presence of improved, well-maintained highways and secondary roads. When the school is located at the intersection of a major highway and a secondary road, entrance to the site should preferably be off the secondary road. In fact, the entrance should be from the least-traveled road in any instance where the site faces on two or more roadways. The absence of the heavier traffic load will insure greater accessibility to the site for the walker, the cyclist, and the driver.

SAFETY FEATURES

A major objective in selecting a site is to provide conditions conducive to the safety of children. The location of the building on the site should permit children to pass through a safety zone before being confronted by traffic dangers. If at all possible, children should not be forced by the location of the school, to cross railroad tracks, automobile speedways or heavy traffic lanes. When this is unavoidable, special plans and provisions should be made to insure student safety. The site should be free from fire, water or other hazards and no major utility trunk lines should pass over or under the instructional or play areas. Roadways on the site should be constructed to accommodate one-way traffic only and proper signs indicating clearly their directional use should be posted. No pupils should have to cross these interior roadways to get to play fields or other campus facilities. It is frequently advisable, especially in elementary schools, to provide fences around playgrounds near roadways.

Where buses are used for transportation, careful consideration should be given to the loading and unloading facilities to achieve the maximum of safety for the children. Parking space should be provided which is properly related to school use. Separate parking space for school visitors, should be provided near the main entrance. Dividends will accrue when parking facilities used for evening functions are amply lighted.



ENVIRONMENT

The activities conducted within a school call for quiet surroundings, free from disturbing industrial, commercial, automobile, truck, aircraft, or other noises. It is also desirable that the site be remote from dust and other atmospheric pollutants and that there be open spaces sufficient to permit free permeation of sunshine to the site. It is unquestionably true that the wholesome cheerfulness and beauty of a site will pervade the entire school and be reflected in countless ways in the attitudes and work of many pupils.

Consideration must also be given to landscaping the site. Most school grounds are planted with lawns, shrubs at the angles and curves of drives and walks, tall trees to frame the building, and shade trees. Whatever the class of tree or plan which is utilized, there should be groupings with respect to height, color and cultivation requirements. Resourceful treatment of the landscape can minimize the amount of noise and bad visual effects transmitted from highways and other noise-producing areas, and the disfiguring effects of essential, but often unsightly, parking areas, service drives, refuse-disposal units, and sewage treatment plants. But all plantings should avoid concealing the view to the potential hazards of driving, cycling and walking.

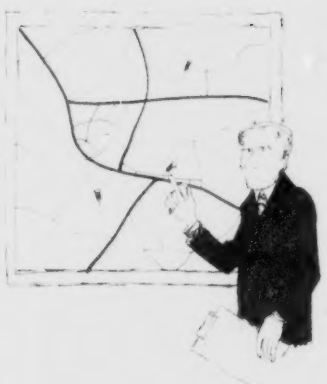
A guiding consideration during planning, as mentioned above, should be the need for and feasibility of the preservation and utilization of existing features of the site which can be utilized in the educational program. This is, of course, in addition to any new site development and landscaping which must be done as a result of construction or the lack of an existing, natural landscape. Listed below are some of the special environmental developments that deserve consideration for inclusion on an appropriate site:

- Soil-erosion demonstration area
- Observation platform
- Baseline and timeline in sidewalks
- Wildlife sanctuary
- Wall of various type rocks if no outcrop is available
- Seashore area
- Marsh or bog
- Soil profile demonstration area
- Picnic site
- Nature trails
- Amphitheatre
- Pond
- Gorge
- Bulb bed
- Cookout area
- Tree stump
- Cavern
- Rock garden
- Water wheel

ECONOMIC CONSIDERATIONS

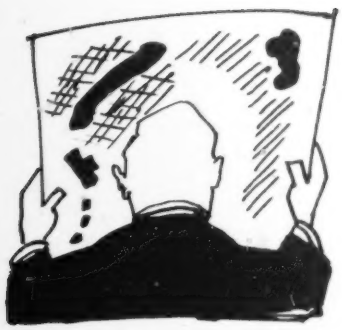
ALTERNATE SITES

Narrowing the selection to the two, perhaps the three or four, most favored sites identified in the selection procedure is desirable if a community is to avoid being at the mercy of a seller aware of his advantageous position of having the only land considered satisfactory for school purposes. There are two major methods of site procurement which represent two routes a school district may take.



Options are agreements wherein one party agrees to sell at a specific price and within a definite period of time to another party who in turn agrees to so buy, or forfeit the price paid for the option. Acquisition of an option permits time for careful comparisons of sites. The optioned properties may be held until a decision is reached on which site to purchase and an appropriation made. Knowledge that a board of education is considering a site often results in a falsely inflated selling price. Occasionally, optioning can be privately and advantageously arranged through a reliable realtor, avoiding general knowledge that the lands involved are being sought by the school district.

Condemnation is a legal procedure sometimes resorted to by a municipality or a board of education when an owner of a needed property is unwilling to sell. Such action is also referred to as the exercise of the "right of eminent domain." In cases of property condemnation the court will usually require proof that the municipality has no other reasonable recourse. The court probably will set the price to be paid, usually as determined through the testimony of qualified witnesses as to property value. Competent legal advice should always be secured regarding the advisability and the conduct of condemnation proceedings.



INITIAL AND DEVELOPMENT COSTS

When consideration is given to total project costs, the cost of land is quite low when compared with the structures and other improvements erected on school sites. However, a poorly suited parcel of land purchased at a minimal cost will seriously restrict development, as discussed in earlier sections of this publication, and, therefore, increase building costs to a marked degree. Careful evaluation and wise selection among sites available are important steps in securing maximum value from project funds.

The least advantageous time, from the cost standpoint, to acquire a school site is at the time the new school building is needed. School site acquisition should anticipate the construction of school buildings by a number of years assuring proper location and avoiding escalation of land costs. Those acquired under last minute pressure, when the need is at hand, usually do not offer these advantages. Experience has also indicated that ultimate site requirements should be met with the initial site acquisition since surrounding lands soon become developed and increase greatly in price, becoming virtually unavailable for future purchase. Long-range planning with respect to site location and acquisition is another basic way to get the most for the facilities dollar.

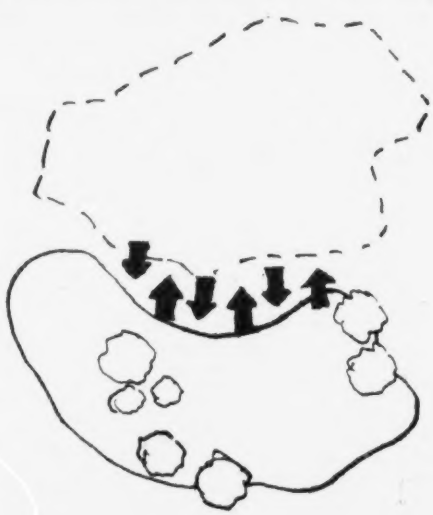
The acquisition of sites should be coordinated with other community developments. As residential areas are developed, recreational areas defined, transportation links built, and services installed, school sites should be acquired in the context of this total development. Such coordinated acquisition can introduce real economies by insuring that proper utilities, transportation and services are available, and that sufficient land is made available to meet the educational needs of the community. The sometimes unpleasant step of condemnation can also be avoided.

Since site costs include purchase price and dollars for development, both must be seriously considered in any realistic site evaluation. In comparing possible sites, using initial cost alone can lead to serious delusions. At this point the project architect, landscape architect, and soils engineer can be particularly valuable consultants. A cost comparison table should be prepared for each of the favored sites being considered, listing besides initial cost, estimates of cost for:

- clearing and grubbing
- demolition and removals
- walks, drives and paving
- athletic, and other facilities
- engineering, boring, subsoil analysis
- sodding, topsoiling and planting
- fencing, gates, barriers
- transportation cost difference
- storm drainage
- earthmoving
- rock removal
- underdrainage
- electrical service
- water supply
- sewage disposal
- noise and pollution control

JOINT USE OF SITES

The separation of school and community into isolated compartments is uneconomical primarily due to duplication of facilities. Separation also gives the school an institutional characteristic that runs contrary to contemporary thinking in education. The school and the community should "pool" at least their outdoor facilities wherever possible: school grounds should be made available for community use, and park space should be made available for school use. Such a policy increases year-round use and reduces duplication and cost of acquiring land. It provides a park setting for parents and children and encourages the feeling that the school is a part of the community. Such cooperative arrangements between school and park boards can also reduce capital maintenance costs.



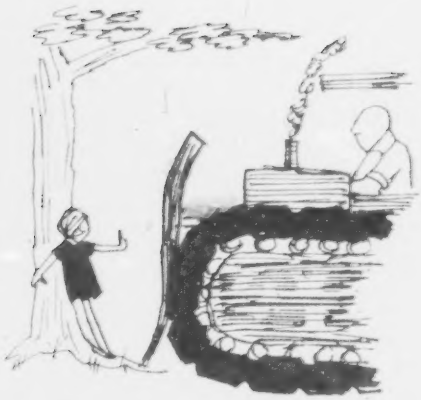
SUPPLEMENTARY CONSIDERATIONS

ORIENTATION OF BUILDING ON THE SITE

It is generally advisable to locate the building on the site in such a way as to permit the maximum use of the light area and to allow for possible future additions. For unilateral lighting it is more important to orient the building to provide the best seeing conditions in the classroom than to locate it with regard to the axis of roads, streets, or other physical features. The best orientation is that which avoids morning or late afternoon sun at right angles to classrooms. It is recommended, however, that the lighting in instructional rooms not be dependent on daylight.

Although schools should have a reasonable set-back from the street line, for reasons of safety and beauty, site utility should be given the highest priority. Schools with long beautiful approaches with the building situated in the center of the site can place severe limitations on spaces to be used for essential physical education and recreational purposes. Therefore, the size, location and development of the various areas for these activities should be considered when the position of the building on the site is determined. It is also important that the building be placed so as to take full advantage of planned site contours.

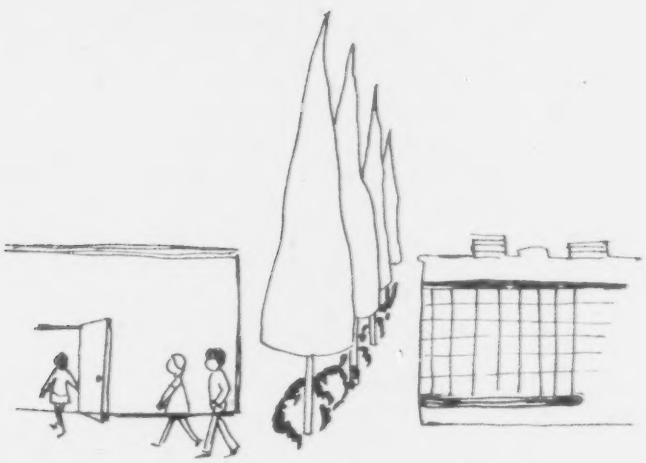
CONTROL OF THE MICRO-CLIMATE



A school site should be carefully planned so that the land is used to its fullest potential. The added cost of preserving existing trees and shrubs as site development is minimal when compared with the large amounts of money which would be spent on total site development or on field trips to compensate for a lack of an adequate micro-climate. When trees and vegetation are scraped away, the land is stripped of natural controls of light, sound, and wind, as well as snow barriers. Control of the micro-climate, through the use of natural elements should be studied carefully. Vegetation is an excellent absorber of both sound and heat and can be used to control as well as to beautify the environment.

SCREENING DEVICES

Plantings may also provide screening between school grounds and adjacent private property or between the school building and other facilities on the site. Where fences are necessary to provide visual separation from private properties, their impact may be reduced by resourceful planting. Where screening from both noise and undesirable views is desired, the use of earth, graded to form barriers, can be effectively used.

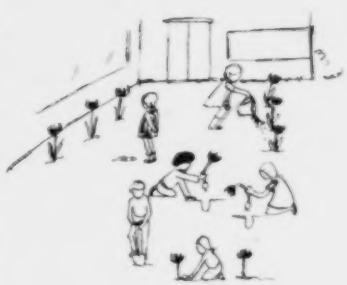


EROSION PREVENTION

Steep slopes are sometimes unavoidable and are subject to erosion and costly maintenance due to runoff and gullying. Rapid-growing plant materials with spreading roots can hold soil and check runoff in areas not subject to constant or intensive human use.

BEAUTIFICATION

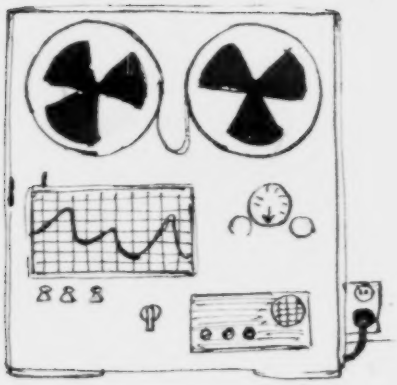
A plan for planting can best be prepared by a competent landscape architect for the school grounds before the actual placement of buildings and other site development items are contemplated. Where money shortages exist, beautification can still become a reality as a comprehensive plan, which will permit the work to be done progressively over a period of years. If all of the planting cannot be done at one time, the planting of grass and trees should be given first priority over shrubs and flowers. Grass suitable for the soil and climate and intended usage should be grown on all areas not be used for special purposes.



Generally, school grounds should be planted in an informal manner with plants which are indigenous to the locality. A more formal planting made up of a broader assortment of refined horticultural varieties may be more sparingly used.

Shrubs, especially the flowering varieties, enhance school grounds. There are many zones of hardiness in the country and shrubs should, therefore, be carefully selected according to climate, soil and shade conditions. Tall-growing shrubbery should not be placed under windows, because neglect of pruning may result in poor classroom lighting conditions. Trees should not be located too close to school buildings for this may create roof drainage blockages, an unnecessary maintenance problem. Perennial vines are desirable on fence rows and blank walls in order to hide unattractive objects, but they are reported to have a tendency to help deteriorate building materials.

It should also be remembered that plantings can be planned for educational purposes as well as beautification of a site. An outdoor education program can benefit greatly by well-preserved and newly planted trees, shrubs, and plants of a wide variety and a well-maintained pond or stream.



INFORMATION AND ASSISTANCE

Establishing the need for a site, site size, and site location is predicated upon the analysis of considerable data. Listed below are several types and sources of information which should prove useful:

1. Pupil enrollment forecasts can be and usually are prepared by the school administration from data on hand and the annual enumeration figures. Local non-public schools should be consulted when enrollment forecasts are being developed. Detailed recommendations on methods for estimating future enrollments are available from the Office of Statistics, Division of Research, Planning, and Evaluation of the State Department of Education.

2. Community and regional master plans, where they exist, should be reviewed for their probable influence on the future of the local school system.

3. Pupil and dwelling-unit spotmaps are frequently prepared by school administrators for transportation and other purposes. These can be a valuable adjunct to planning for future sites.

4. Land-use maps are most frequently found where there is community planning and urban redevelopment. Such maps can provide much valuable information.

5. Geodetic and soil survey maps are available from the State Library. They are most useful in the preliminary study of prospective sites, especially as they provide information on the contours of the land, drainage and general underlying soil conditions.

6. Studies are made by gas, electric power and telephone companies in their long-range planning programs. These studies ordinarily are shared most willingly with local officials.

7. Land realtors can be most helpful through their intimate knowledge of land values and growth trends in their working areas. Residential developers' activities can have alarming repercussions on school systems if they come as a surprise. Every effort should be made to ascertain the intentions of any developers, both as to the extent and timing of their plans.

8. Aerial photographs are possessed by many towns for assessment purposes and can be helpful in reviewing features of tracts under consideration.

9. State Transportation Department plans for constructing new highways or relocating existing ones in and near the areas under consideration should be studied. Major traffic arteries in the general area, although not passing through a particular town, may have a noticeable effect on residential development because of easier commuting to cities and other industrial or commercial centers.

10. Town officials or recreation agencies will usually be in the best position to foresee developing needs for community recreation facilities and services and, therefore, should be consulted in these matters.

11. Chamber of Commerce and Industrial Development Commission plans are useful in analyzing the impact that the up-grading of business and industry in the area might have on the schools.

12. Urban development data (house counts, empty lot counts, utility lines and service connections, telephone connections, real estate transactions and building permit data) are all helpful indicators of urban development and are available from local planning bodies and regulatory agencies.

13. Banks, mortgage companies and other funding agencies often have advance information as to development intents. Consult them.

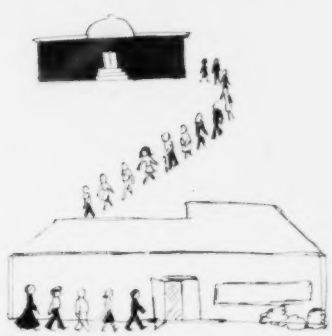
14. Consultative services are available upon request from the Bureau of Facility Planning, the Department of Environmental Protection, and the U.S. Department of Agriculture.

APPROVALS

Before land may be acquired, or voted upon for acquisition, by a local district, approval must be obtained from the State Department of Education.

In order for the Department of Education to consider the approval of land acquisition by a board of education it is necessary that the Director of Facility Planning Services be provided with the following:

1. A request from the board of education for such approval and a statement indicating the immediate and ultimate proposed uses of the land in terms of grade organization and potential, maximum enrollment.
2. A statement from the State Department of Environmental Protection that the land can be adequately provided with the necessary water and an acceptable sewage disposal system for the proposed, ultimate maximum enrollment.
3. A statement from an architect or engineer indicating that the land to be acquired is suitable for the proposed use.
4. A complete plot plan of the land to be acquired showing topographical contour lines, adjacent properties (on all sides) and access roads. The acreage and dimensions of the tract proposed for acquisition shall be included.
5. A map of the school district showing the location of the land and the location of existing schools in the district.
6. Appraisal or recommendations of the County Superintendent of Schools.
7. It is not mandated but, if available, a pupil distribution-map showing places of residency.
8. If existing buildings are located on the land to be acquired, the intended use and/or disposition of these buildings should be indicated. Any building to be acquired must comply with the regulations of the State Board of Education which apply to the construction of a new building.



SELECTED REFERENCES

American Institute of Architects. *School Site Selection and Utilization.* Washington, D.C.: AIA School Plant Studies, 1965.

Andrews, L.E., "Site", *Guidelines for School Planning and Construction,* Association of School Business Officials, Chicago, Illinois: 1968.

California State Department of Education. *School Site Analysis and Development.* Sacramento, California: Bureau of School Planning, 1966.

CEFP. *Guide for Planning Educational Facilities.* Columbus, Ohio: Council of Educational Facility Planners, 1969.

CEFP. *What Went Wrong?* Columbus, Ohio: Council of Educational Facility Planners, 1968.

Connecticut Department of Education. *School Sites, Selection and Acquisition.* Hartford Bureau of School Buildings, Connecticut Department of Education, 1960.

Department of the Interior. *Outdoor Recreation Space Standards.* Washington, D.C.: Bureau of Outdoor Recreation, Department of the Interior, 1967.

Englehardt, Nicholas L. *Complete Guide for Planning New Schools.* New York: Parker Publishing Company, 1970.

Fresno Unified School District. *Long Range School Site Location Plan.* Fresno, California: 1969.

Kansas State Department of Public Instruction. *School Sites Selection and Development.* Topeka: School Facilities Services, Kansas State Department of Public Instruction, 1966.

Minnesota Department of Education. *Guide for Educational Planning of School Buildings and Sites in Minnesota.* St. Paul: State Department of Education, 1966.

New Jersey Department of Education. *Guide for Schoolhouse Planning and Construction.* Trenton: Facility Planning Services, 1969.

Ontario Department of Education. *Principles of State Development – Elementary Schools K-6.* Ontario, Canada: Division of School Planning and Building Research.

Participants in National Facilities Conference. "Planning Areas and Facilities for Health, Physical Education and Recreation." *The Athletic Institute and American Association for Health, Physical Education, and Recreation,* 1965.

Tonigan, Richard F., "Keeping the School Site An Asset," *School Management,* June 1970.

University of the State of New York. *The School Site and Development of School Grounds.* Albany, New York: Division of School Buildings and Grounds, 1963.